THE EFFECTIVENESS OF COOPERATIVE LEARNING MODEL OF TGT TYPE AND NHT ON STUDENT LEARNING OUTCOMES OF GRADE VII OF SMP

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ABSTRACT

A conventional learning model that is still used in the mathematics learning process at school causing less active students in the class because they are just sitting, listening, and make a note when the teacher explains the lesson. This is experimental research aimed at finding out the cooperative learning model's effectiveness between type TGT (Teams Games Tournament) and NHT (Numbered Heads Together). This research population consists of 4 classes from seventh-grade students in State Junior High School 1 Turi Sleman (SMPN 1 Turi Sleman) in 2017/2018. This research uses a purposive sampling technique, where VII C and VII B as an experimental class. Instrument tests include validity tests, power differentiator tests, and reliability tests. In analyzing the data, this research uses an analysis prerequisite test consisting of a normality test and homogeneity test. The hypothesis test uses two t-tests and a one-party test. Two t-tests, with a significant level of 5% and 61 degrees of freedom, show that $t_{count} = 3.2991952$ and t_{table}=1,99996 with the result $t_{count} > t_{table}$. It shows that H_0 denied and H_1 accepted, which means there are differences in learning mathematics results in seventh-grade students of SMP Negeri 1 Turi Sleman using cooperative learning model type TGT with type NHT. Based on the calculation of a one-party t-test with a significant level of 5% and 61 degrees of freedom, it shows that $t_{count} = 3.2991952$ and t_{table}= 1.670385 with the result $t_{count} > t_{table}$. This indicates that H_0 is denied and H_1 accepted, which means that cooperative learning model type TGT is more effective than type NHT reviewed by mathematics learning result of the seventh-grade students SMPN 1 Turi district Sleman in the academic year 2017/2018.

Keywords: Effectiveness, Teams Games Tournament, Numbered Heads Together, Learning Outcomes Mathematics

INTRODUCTION

Teaching and learning activities are the primary and main educational process in a nation. Education determines the quality of a nation applied to the nation. According to Slameto (2015: 2), learning is a process of effort by someone to obtain a new change in behavior as a whole, as a result of his own experience in interaction with his environment. The learning process carried out in school is assisted by the teacher as a facilitator. The teacher plays a vital role in fostering student interest in learning. Students' interest in learning can grow with encouragement and several teachers' models when conducting the class's learning process. If students have a high interest in learning, students will quickly get the desired learning outcomes. According to Dimyati and Mudjiono (2013: 3), learning outcomes result from an interaction of learning and teaching. Mathematics is one of the subjects taught from Elementary School (SD) to High School (SMA). That is because mathematics is a science that is important for daily life. The process of learning mathematics in schools that are still teacher-centered makes students less active in the classroom. In this learning, students do not play an optimal role because they only sit, listen to the teacher to explain the learning material, and take notes.

Based on the results of interviews with Mr. Darwanto, Amd.Pd. As a grade VII mathematics teacher at SMP Negeri 1 Turi, Sleman Regency, on Tuesday, September 26, 2017, that if lectures still dominated teachers in carrying out the mathematics learning process, students would be easily bored. The mathematics teacher said that he had already applied group discussion in mathematics learning. The teacher divides the class into small groups and then presentations in front of the class, but the results are not satisfactory. This expression is supported by the value of mathematics learning outcomes that are still

relatively low. The poor student learning outcomes can be seen from the number of students who get grades below the MCC (Minimum Completenes Criteria) at 75 at PTS (Mid-Semester Assessment), even the academic year 2017/2018. The number of students can be seen in table 1.

Table 1. Many Grade VII Students with a Grade Below or Above MMC in PTS Even Semester 2017/2018

Criteria	Class				Amount
	VII A	VII B	VII C	VII D	
≥ 75	8	2	10	12	32
< 75	24	29	22	20	95

Source: *SMP N 1 Turi Sleman*

Based on the table, the percentage of students with grades below the MCC exceeds 50%. When preparing mathematics learning, the classroom's conditioning to divide students into small groups is less effective. That is because, during elementary school, some students had never studied in groups, so students were not accustomed to group work. For some students, group work is new, so it takes time for students to adapt to group work. When discussing, students do not focus on the material being learned instead of talking about other topics with their friends. The teacher also said that class VII had never compared mathematics learning outcomes using the TGT and NHT cooperative learning models.

In another time, based on the results of interviews with VII grade students of SMP Negeri 1 Turi Sleman, students need variations in new learning models that can increase students' interest and enthusiasm for learning. That, group work in the class is only done to do the questions and then collected. The group members do not change, so students are lazy and fed up when learning to do the model.

Based on observations during the mathematics learning process in class VII A SMP Negeri 1 Turi Sleman, most students were still shy and were not ready to answer questions when the teacher made an apperception. When the learning process is carried out in groups or discussions, classroom conditioning has not run smoothly and effectively because students look confused, and many are crowded. In the small group, only a few students did a discussion to understand the teacher's material. Students' competitiveness in obtaining scores or scores during group discussions tends to be low due to the small number of students who offer themselves when allowed to write the discussion results on the board.

Therefore, to find out what type of learning model can reduce the level of unpreparedness and low competitiveness and help provide solutions for VII grade students of SMP Negeri 1 Turi Sleman, two cooperative learning models will be compared in two different classes, namely the type of cooperative learning model TGT and NHT. This study's objectives are: (1) to find out whether there are differences in mathematics learning outcomes using the TGT type cooperative learning model and NHT type in grade VII students of SMP Negeri 1 Turi, Sleman Regency in the even semester of the academic year 2017/2018. (2) To determine which one is more effective between the TGT type cooperative learning model and the NHT type in terms of mathematics learning outcomes for Grade VII students of SMP Negeri 1 Turi, Sleman Regency in the even semester of the academic year 2017/2018.

METHODS

This research is experimental. According to Sugiyono (2016: 107), experimental research methods can be interpreted as a research method used to look for the effect of specific treatments on others under controlled conditions. The design used in this study is the right experimental design. This study's type of true experimental design is a post-test-only control design with two treatments, namely two experimental classes. This research was conducted at SMP Negeri 1 Turi Sleman in class VII, even the semester of 2017/2018. The time of data collection in this study was 01-14 May 2018. In this study, sampling used a purposive sampling technique and selected class VII C as a TGT experimental class consisting of 32 students and class VII B as an NHT experimental class consisting of 31 students and class VII D as a trial class consisting of 32 students.

Data collection techniques in this study used documentation and tests. The documentation carried out in this study is to take the results of the midterm even semester of the academic year 2017/2018 to obtain student's initial ability data. At the same time, the type of test conducted is a posttest. In this study, the instrument used was a mathematics achievement test (posttest) in the form of multiple choices with four alternative answers, namely A, B, C, and D. Correct answers would be given a score of 1 and for incorrect answers given a score of 0. The measured aspects were cognitive aspects, which include: aspects of knowledge (C_1), aspects of understanding (C_2), and aspects of the application (C_3). The instrument trials in this study are the validity test, the differentiation test, and the reliability test. Data analysis techniques include (1) prerequisite analysis tests consisting of normality and homogeneity tests, (2) hypothesis testing consisting of two-party hypothesis testing, and one-party hypothesis testing.

RESULTS AND DISCUSSION

Mathematics learning outcomes test is conducted to determine the final results of student grades after treatment (treatment) in each experimental class. From the study results, obtained test scores of mathematics learning outcomes can be seen in the following table:

Table 2. Statistical Descriptions of Mathematics Learning Outcomes Test Results

Variable	Kelas Eksperimen TGT	Kelas Eksperimen NHT
N	32	31
amount	2164,7	1835,27
Average	67,646875	59,2022581
Minimum	47,06	47,06
Maximum	88,23	88,23
Standard Deviation	10,6697896	9,5978121
Variance	113,8444093	92,1179981

The assessment used in this test is the total score from the objective test. Correct answers are given a value of 1, and incorrect answers, given a value of 0. From the table above, it can be seen that in the TGT experimental class, the lowest value is 47.06, and the highest value is 88.23, with an average of 67.646875. In the NHT experimental class, the lowest value was 47.06, and the highest was 88.23, with an average of 59.2022581.

A normality test is used to find out whether the mathematics learning achievement test data is usually distributed or not. In this test, the Chi-square test is used. The summary of normality tests for the TGT experimental class and the NHT experimental class is presented in the following table:

Table 3. Summary of Test Normality in Mathematics Learning Outcomes Test Data

Learning model	χ^2_{count}	χ^2_{table}	α	df	Info.
TGT Class	6,84241	7,8147	0,05	3	Normal
NHT Class	4,31499	5,9915	0,05	2	Normal

Criteria data is normally distributed if $\chi^2_{count} < \chi^2_{table}$. Based on the calculation of the normality test with a significant level of 0.05 and dk = 3, for the TGT experimental class obtained $\chi^2_{count} = 6{,}84241735$ and $\chi^2_{table} = 7{,}8147$, then $\chi^2_{count} < \chi^2_{table}$. So that the test results of mathematics learning outcomes of the TGT experimental class can be concluded as a normal distribution. For the NHT experimental class obtained $\chi^2_{count} = 4{,}31499217$ and $\chi^2_{table} = 5{,}9915$ with a significance level of 0.05 and df = 2, then $\chi^2_{count} < \chi^2_{table}$. So that the mathematics learning achievement test data for the NHT experimental class can be concluded as a normal distribution.

The homogeneity test is used to determine whether the mathematics learning achievement test data has the same variance or diversity. In this homogeneity test, the Bartlett Test is used. A summary of the homogeneity test results can be seen in the following table:

Table 4. Summary of Homogeneity Test Results Mathematics Learning Outcomes Test Data

χ^2_{count}	χ^2_{table}	α	df	Info.
0,34080809	3,8415	0,05	1	homogeneous

Homogeneous data criteria if $\chi^2_{count} < \chi^2_{table}$. Based on the calculation of homogeneity test data on mathematics learning outcomes of the two experimental classes with a significant level of 0.05 and dk = 1, obtained $\chi^2_{count} = 0{,}34080809$ and $\chi^2_{table} = 3{,}8415$, then $\chi^2_{count} < \chi^2_{table}$. So it can be concluded that the data variance of both homogeneous experimental classes' mathematics learning outcomes.

Hypothesis testing of two parties for the mathematics learning outcomes test data is carried out using t-test analysis. A T-test was conducted to determine whether there are differences in the mathematics learning achievement test data of TGT experimental class students and NHT experimental class students. A summary of t-test results or average similarities can be seen in the following table:

Table 5. Summary of T-Test Data on Mathematics Learning Outcomes Tests

t_{count}	t_{table}	α	df	Info.
3,2991952	1,99996	0,05	61	H_0 rejected, and H_1 accepted.

Based on calculations made at a significant level of 0.05 and dk = 61, we get $t_{count} = 3{,}2991952$ and $t_{table} = 1{,}99996$, then $t_{count} > t_{table}$. So it can be concluded that H_0 is rejected, and H_1 is accepted, which means there is a difference in the data of students' mathematics learning outcomes using the TGT type cooperative learning model with the results of students learning mathematics using the NHT type cooperative learning model.

One-party hypothesis testing is performed using t-test analysis. The *t-test* in the one-party hypothesis test was carried out to determine the treatment's effectiveness applied to two different classes, namely the TGT experimental class and the NHT experimental class. A summary of the t-test data of mathematics learning outcomes can be seen in the following table:

Table 6. Summary of T-Test for Mathematics Learning Outcomes Test Data

t_{count}	t_{table}	α	df	Info.
3,2991952	1,670385	0,05	61	H_0 rejected, and H_1 accepted.

Based on the calculations made at a significant level of 0.05 and df = 61, we obtain $t_{count} = 3{,}2991952$ and $t_{table} = 1{,}670385$, then $t_{count} > t_{table}$. So it can be concluded that H_0 is rejected and H_1 is accepted, which means that the cooperative learning model of the TGT type is more effective than the NHT type in terms of mathematics learning outcomes of Grade VII students of SMP Negeri 1 Turi, Sleman Regency in the even semester of the academic year 2017/2018.

Through TGT type cooperative learning, students have the freedom to interact and express their opinions in a group that can increase self-confidence. Disruptive behavior of other students becomes smaller because students are more focused on discussions in their respective groups. TGT type of cooperative learning can increase student motivation in learning and understanding a particular subject. At the end of the meeting, there will be a tournament between groups. The tournament triggers students to be more active in group discussions, increases students' thinking power, and triggers students to compete positively to get satisfying results. Based on researchers' observations when using the TGT type of cooperative learning model, the learning process runs smoothly. Students are seen to be serious in discussions so that at the last meeting, students can work on the mathematics learning achievement test results smoothly and satisfying grades.

In NHT type cooperative learning, students are grouped heterogeneously. Students can conduct discussions seriously, and for smarter students can teach less smart students. Also, students in groups are responsible for their group assignments. This type of NHT cooperative learning requires students to play an active role in the group to understand the questions' answers. At the end of the meeting, the teacher

will call a number at random. Although the NHT type of cooperative learning can run smoothly, some students are less focused on the group, so the discussion is not optimal. So that at the time of the mathematics learning achievement test, not a few students are confused about working on the test, and the results are less satisfying. Then due to time constraints, not all students can be called.

The description above illustrates that learning using the TGT type of cooperative learning model positively influences mathematics learning outcomes. Supported by research conducted by Nur Rochimawati (2016) that TGT type cooperative learning models are more effective than NHT type cooperative learning models in terms of learning outcomes in mathematics. In this study shown by the results of mathematics learning, students who use the TGT type cooperative learning model is better than the mathematics learning outcomes of students who use the NHT type cooperative learning model on the subject of the quadrilateral class VII SMP Negeri 1 Turi Sleman even semester 2017/2018 school year.

CONCLUSION

Based on the description above, it can be concluded that (1) There are differences in mathematics learning outcomes of Grade VII students of SMP Negeri 1 Turi, Sleman Regency in the even semester of the academic year 2017/2018 using the TGT type cooperative learning model with the mathematics learning outcomes of students who use NHT type cooperative learning models. This is indicated by the results of calculations performed at a significant level of 0.05 and df = 61, obtained $t_{count} = 3{,}2991952$ and $t_{table} = 1{,}99996$, then $t_{count} > t_{table}$. So it can be concluded that H_0 is rejected, and H_1 is accepted. (2) The TGT type of cooperative learning model is more effective than the NHT type in terms of the mathematics learning outcomes of Grade VII students of SMP Negeri 1 Turi, Sleman Regency in the even semester of the academic year 2017/2018. This is indicated by the results of calculations performed at the significant level of 0.05 and df = 61, obtained $t_{count} = 3{,}2991952$ and $t_{table} = 1{,}670385$, so $t_{count} > t_{table}$. So it can be concluded that H_0 is rejected, and H_1 is accepted.

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